IN THE CLAIMS

Please amend the claims as follows:

Claim 1 (Previously Presented): A maximum likelihood decoding method for obtaining original information by decoding a reproduced signal from a recording medium or a reproduced signal obtained through a transmission medium, the method comprising:

a first-metric generating step for generating a metric of a reproduced signal generated based on a first partial response, the metric being a first metric;

a second-metric generating step for generating a metric of a reproduced signal generated based on a second partial response, the metric being a second metric; and

a maximum likelihood decoding step for realizing maximum likelihood decoding by using the first metric and the second metric,

wherein the second partial response is a differential partial response obtained by calculating a difference between the first partial response and a response generated by shifting the first partial response by 1 channel clock.

Claim 2 (Original): The method according to Claim 1, wherein the first partial response has a predetermined frequency characteristic which can be realized by adjusting a frequency characteristic of a channel for generating a reproduced signal based on a data signal.

Claim 3 (Original): The method according to Claim 1, wherein the first partial response is generated by equalizing a reproduced signal, which is reproduced by transferring a data signal, by using a waveform equalizer.

Claim 4 (Original): The method according to Claim 1, wherein, in the first-metric generating step, the first metric is generated by calculating a metric between a reproduced signal generated by equalizing a reproduced data signal to the first partial response and a reference signal obtained by inputting a data sequence which can serve as a decoded data sequence to the first partial response.

Claim 5 (Cancelled).

Claim 6 (Original): The method according to Claim 1, wherein, in the second-metric generating step, the second metric is generated by calculating a metric between a reproduced signal generated by equalizing a reproduced data signal to the second partial response and a reference signal obtained by inputting a data sequence which can serve as a decoded data sequence to the second partial response.

Claim 7 (Currently Amended): The method according to Claim 1, wherein the first metric and the second metric [[is]] are the square of a difference in an amplitude level between a sample of a reproduced signal generated by reproducing a data signal based on a predetermined partial response and a sample of a reference signal generated by using a data signal which can serve as a decoded data signal based on the partial response.

Claim 8 (Currently Amended): The method according to Claim 1, wherein the first metric and the second metric [[is]] are the absolute value of a difference in an amplitude level between a sample of a reproduced signal generated by reproducing a data signal based on a predetermined partial response and a sample of a reference signal generated by using a data signal which can serve as a decoded data signal based on the partial response.

Claim 9 (Currently Amended): The method according to Claim 1, wherein the first metric and the second metric [[is]] are the function of a difference in an amplitude level between a sample of a reproduced signal generated by reproducing a data signal based on a predetermined partial response and a sample of a reference signal generated by using a data signal which can serve as a decoded data signal based on the partial response.

Claim 10 (Original): The method according to Claim 1, wherein the maximum likelihood decoding step comprises:

a metric synthesizing step for synthesizing the first metric and the second metric at a predetermined ratio; and

a Viterbi decoding step for obtaining original data by using the synthetic metric by maximum likelihood decoding.

Claim 11 (Original): The method according to Claim 10, wherein the ratio of the first metric and the second metric is adjusted in accordance with the frequency characteristic of noise contained in a reproduced signal reproduced by transferring a data signal.

Claim 12 (Previously Presented): The method according to Claim 1, wherein a Viterbi algorithm is used in the maximum likelihood decoding step, and a data pattern representing states which form the Viterbi algorithm includes data of a number the same as the number required for generating the first partial response.

Claim 13 (Previously Presented): The method according to Claim 1, wherein a Viterbi algorithm is used in the maximum likelihood decoding step, and a data pattern

representing states which form the Viterbi algorithm includes data of a number smaller by one than the number required for generating the second partial response.

Claim 14 (Previously Presented): The method according to Claim 1, wherein a Viterbi algorithm is used in the maximum likelihood decoding step, and a data pattern representing states which form the Viterbi algorithm includes data of a number the same as the number required for generating the second partial response.

Claim 15 (Original): The method according to Claim 1, wherein a Viterbi algorithm is used in the maximum likelihood decoding step, the first metric is defined to each state of Viterbi decoding, and the second metric is defined to each branch of Viterbi decoding.

Claim 16 (Original): The method according to Claim 1, wherein a Viterbi algorithm is used in the maximum likelihood decoding step, and the first metric and the second metric are defined to each branch of Viterbi decoding.

Claim 17 (Original): The method according to Claim 1, wherein a Viterbi algorithm is used in the maximum likelihood decoding step, the first metric is defined to each branch of Viterbi decoding, and the second metric is defined to each state of Viterbi decoding.

Claim 18 (Original): The method according to Claim 1, wherein a Viterbi algorithm is used in the maximum likelihood decoding step, and a survival path to each state has the smallest path metric in paths to each state.

Claim 19 (Previously Presented): The method according to Claim 1, wherein a Viterbi algorithm is used in the maximum likelihood decoding step, and the path metric of a path in each state can be obtained by multiplying a metric to the first partial response by a predetermined constant and then adding the result to the path metric of a survival path to each state.

Claim 20 (Previously Presented): The method according to Claim 1, wherein a Viterbi algorithm is used in the maximum likelihood decoding step, and the path metric of a path in each branch can be obtained by multiplying a metric to the second partial response by a predetermined constant and then adding the result to the path metric of a survival path to each branch.

Claim 21 (Previously Presented): A maximum likelihood decoder for obtaining original information by decoding a reproduced signal from a recording medium or a reproduced signal obtained through a transmission medium, the decoder comprising:

first-metric generating means for generating a metric of a reproduced signal generated based on a first partial response, the metric being a first metric;

second-metric generating means for generating a metric of a reproduced signal generated based on a second partial response, the metric being a second metric; and

maximum likelihood decoding means for realizing maximum likelihood decoding by using the first metric and the second metric,

wherein the second partial response is a differential partial response obtained by calculating a difference between the first partial response and a response generated by shifting the first partial response by 1 channel clock.

Claim 22 (Original): The maximum likelihood decoder according to Claim 21, wherein the first partial response has a predetermined frequency characteristic which can be realized by adjusting a frequency characteristic of a channel for generating a reproduced signal based on a data signal.

Claim 23 (Original): The maximum likelihood decoder according to Claim 21, further comprising a waveform equalizer for equalizing a reproduced signal, which is reproduced by transferring a data signal, to the first partial response.

Claim 24 (Original): The maximum likelihood decoder according to Claim 21, wherein the first-metric generating means generates the first metric by calculating a metric between a reproduced signal generated by equalizing a reproduced data signal to the first partial response and a reference signal obtained by inputting a data sequence which can serve as a decoded data sequence to the first partial response.

Claim 25 (Cancelled).

Claim 26 (Original): The maximum likelihood decoder according to Claim 21, wherein the second-metric generating means generates the second metric by calculating a metric between a reproduced signal generated by equalizing a reproduced data signal to the second partial response and a reference signal obtained by inputting a data sequence which can serve as a decoded data sequence to the second partial response.

Claim 27 (Currently Amended): The maximum likelihood decoder according to Claim 21, wherein the first metric and the second metric [[is]] <u>are</u> the square of a difference

in an amplitude level between a sample of a reproduced signal generated by reproducing a data signal based on a predetermined partial response and a sample of a reference signal generated by using a data signal which can serve as a decoded data signal based on the partial response.

Claim 28 (Currently Amended): The maximum likelihood decoder according to Claim 21, wherein the first metric and the second metric [[is]] are the absolute value of a difference in an amplitude level between a sample of a reproduced signal generated by reproducing a data signal based on a predetermined partial response and a sample of a reference signal generated by using a data signal which can serve as a decoded data signal based on the partial response.

Claim 29 (Currently Amended): The maximum likelihood decoder according to Claim 21, wherein the first metric and the second metric [[is]] are the function of a difference in an amplitude level between a sample of a reproduced signal generated by reproducing a data signal based on a predetermined partial response and a sample of a reference signal generated by using a data signal which can serve as a decoded data signal based on the partial response.

Claim 30 (Original): The maximum likelihood decoder according to Claim 21, wherein the maximum likelihood decoding means comprises:

metric synthesizing means for synthesizing the first metric and the second metric at a predetermined ratio; and

Viterbi decoding means for obtaining original data by using the synthetic metric by maximum likelihood decoding.

Claim 31 (Original): The maximum likelihood decoder according to Claim 30, wherein the metric synthesizing means adjusts the ratio of the first metric and the second metric in accordance with the frequency characteristic of noise contained in a reproduced signal reproduced by transferring a data signal.

Claim 32 (Previously Presented): The maximum likelihood decoder according to Claim 21, wherein a Viterbi algorithm is used in the maximum likelihood decoding means, and a data pattern representing states which form the Viterbi algorithm includes data of a number the same as the number required for generating the first partial response.

Claim 33 (Previously Presented): The maximum likelihood decoder according to Claim 21, wherein a Viterbi algorithm is used in the maximum likelihood decoding means, and a data pattern representing states which form the Viterbi algorithm includes data of a number smaller by one than the number required for generating the second partial response.

Claim 34 (Previously Presented): The maximum likelihood decoder according to Claim 21, wherein a Viterbi algorithm is used in the maximum likelihood decoding means, and a data pattern representing states which form the Viterbi algorithm includes data of a number the same as the number required for generating the second partial response.

Claim 35 (Original): The maximum likelihood decoder according to Claim 21, wherein a Viterbi algorithm is used in the maximum likelihood decoding means, the first metric is defined to each state of Viterbi decoding, and the second metric is defined to each branch of Viterbi decoding.

Claim 36 (Original): The maximum likelihood decoder according to Claim 21, wherein a Viterbi algorithm is used in the maximum likelihood decoding means, and the first metric and the second metric are defined to each branch of Viterbi decoding.

Claim 37 (Original): The maximum likelihood decoder according to Claim 21, wherein a Viterbi algorithm is used in the maximum likelihood decoding means, the first metric is defined to each branch of Viterbi decoding, and the second metric is defined to each state of Viterbi decoding.

Claim 38 (Original): The maximum likelihood decoder according to Claim 21, wherein a Viterbi algorithm is used in the maximum likelihood decoding means, and a survival path to each state has the smallest path metric in paths to each state.

Claim 39 (Previously Presented): The maximum likelihood decoder according to Claim 21, wherein a Viterbi algorithm is used in the maximum likelihood decoding means, and the path metric of a path in each state can be obtained by multiplying a metric to the first partial response by a predetermined constant and then adding the result to the path metric of a survival path to each state.

Claim 40 (Previously Presented): The maximum likelihood decoder according to Claim 21, wherein a Viterbi algorithm is used in the maximum likelihood decoding means, and the path metric of a path in each branch can be obtained by multiplying a metric to the second partial response by a predetermined constant and then adding the result to the path metric of a survival path to each branch.